



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/651,998	08/31/2000	Lingyi A Zheng	M4065.0315/P315	2931
24998	7590	10/13/2004	EXAMINER	
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP			TSAI, H JEY	
2101 L STREET NW			ART UNIT	
WASHINGTON, DC 20037-1526			PAPER NUMBER	

2812

DATE MAILED: 10/13/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/651,998

Applicant(s)

ZHENG ET AL.

Examiner

H.Jey Tsai

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-59 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-59 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 40, 42-43 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Takeuchi 5,907,183, previously applied.

Takeuchi discloses a method of forming a semiconductor device, which includes

:

forming a polysilicon conductive layer 23 or 41, figs. 2A-2B or figs. 3B+ and col. 6, lines 38+,

forming a silicon nitride layer 24 (a part of NON film 27, 60 angstroms, col. 8, lines 16+),

using method (10) from col. 5, lines 22-49 and col. 4, lines 8+, contacting silicon nitride layer with a mixture of hydrogen and oxidizing oxygen and nitrous gases (N₂O) to form an oxidation layer (oxide film by thermal oxidation, 25) over the silicon nitride layer 24,

forming an upper polysilicon electrode 28 contiguous (near) with or on (proximity) the oxidation layer, col. 7, lines 15+,

since, capacitor is a structure of a dielectric layer sandwiched between two conductive films, hence, layers 23/24(27)/28 inherently formed a capacitor as a part of memory device, see tile of invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-39, 41, 44-59 stand rejected under 35 U.S.C 103 as being unpatentable over Takeuchi 5,907,183 as applied to claims 1, 40, 42-43 above, and further in view of Das et al. 6,281,141 and Lee et al. 6,015,733, all are previously applied.

The difference between the references applied above and the instant claim(s) is: Takeuchi teaches forming an oxidation layer over a silicon nitride layer using oxidation gases but does not teach various thickness and gas flow rates. However, Das teaches at abstract and col. 8, lines 1 to col. 9, lines 42, that various coating temperature, thickness (less than 60 angstroms) and gas flow rate for forming thin oxidation oxide layer. And, Lee et al. teaches at col. 5, lines 28+, the total thickness of ONO layer is between 40 to 80 Angstroms with oxidation layer thickness at about 31 to 50 Angstroms (the nitride layer is not totally oxidized). And, In addition, specific thickness of coating layer, gas flow rate and ratio and gas contacting temperature as claimed are taken to be obvious since these are variables of art recognized importance which are subject to routine experimentation and optimization and discovery of an optimum value for a known process is obvious. In re Aller, 105 USPQ 233 (CCPA 1955). And, even if applicants' modification results in great improvement and utility over the prior art, it may

Art Unit: 2812

still not be patentable if the modification was within the capabilities of one skilled in the art, *In Re Sola* 25 USPQ 433.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the above references' teachings with various gas flow rate and deposition temperature to obtain a desired thickness of an oxidation layer formed over a silicon nitride layer as taught by Das and Lee because an optimum capacitance of a capacitor can be obtained by simply change the thickness of the capacitor dielectric layer.

Conclusion

Applicant's arguments filed July 23, 2004 have been fully considered but they are not persuasive because Takeuchi clearly teaches forming polysilicon conductive layer 23 or 41 on or contiguous (near or next to, see any dictionary for the definition of word "on" and "contiguous") with the oxidation layer 25 as set forth above.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2812

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry of a general nature or clerical matters or relating to the status of this application or proceeding should be directed to the Group customer service whose telephone number is (571) 272-1626 and Fax number (703) 872-9306.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to H. Jey Tsai whose telephone number is (571) 272-1684. The examiner can normally be reached on from 7:00 Am to 4:00 Pm., Monday thru Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on (571) 272-1679. The fax phone number for this Group is (703) 872-9306.

hjt

10/7/04



H. Jey Tsai
Primary Examiner
Patent Examining Group 2800